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# BLACK ROT OF CRUCIFERS

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Black rot, caused by the bacterium Xanthomonas campestris (Para.) Dows., is one of the most destructive diseases of crucifers. It is commonly found throughout the world and is endemic in cabbage in the southeastern United States (3). The disease, first **found** in Kentucky in 1891, was one of the first bacterial diseases known to be seed-borne (4). Entire fields of mature cabbage have been disced under due to black rot. Because a single plant in a field may produce enough inoculum for an epidemic under favorable conditions, efforts should be made in the southeast to eliminate the pathogen. Infection can be initiated not only from infected plants through infected seed but also from infested soil (3).

SYMPTOMS. Infection of the cotyledons begins as dark, sunken spots which can be confused with downy mildew (2). Indefinite chlorotic patterns develop where several spots occur. Then, the veins become infected and form a characteristic black network (Fig. 1A). The bacterium becomes systemic and moves into the stem through the cotyledonary node before the cotyledons turn yellow and drop. In leaves, infection occurs most often through the hydathodes (water pores) at the leaf margin. The tissues turn yellow, then tan in the form of a "V", with the base of the "V" pointed toward the midrib (Fig. 1B). Vascular discoloration extends to the main stem and progresses upward and downward. The systemic invasion proceeds into the upper leaves, causing chlorotic lesions anywhere on the leaves and stunting them. Early defoliation may occur. Cabbage and cauliflower heads are invaded and discolored. In turnip and rutabaga, the vascular bundles develop a black discoloration and internal breakdown (3).

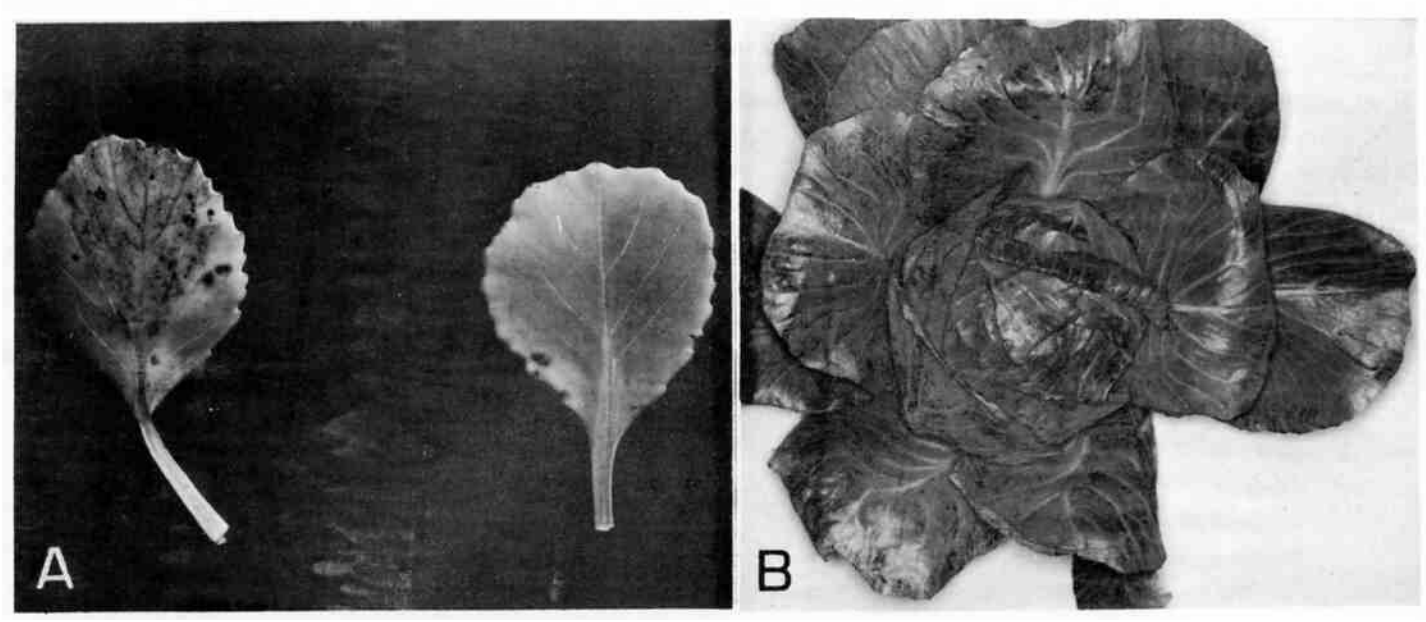


Fig. 1. Xanthomonas campestris on Brassica oleracea var. capitata. A) Cotyledons showing wet spots and characteristic blackened veins; B) Mature cabbage head showing tan necrosis starting from infected water pores on edge of leaves.

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DISEASE SPREAD. The disease may begin in seedlings from infected seed, from diseased plant refuse, or from nearby infested fields. Field spread is mainly by splashing rain or irrigation water, cultivating implements, and transplants. Long distance spread is by infested seed and diseased transplants (4). Disease development is favored by hot, wet weather (1).

CONTROL. For transplant growers (4, 5):

1. Use seed that has been hot-water treated at 50 C (122 F) for 25-30 minutes and certified free of Xanthomonas campestris.
2. Seedbeds or greenhouses should be at least one-quarter mile from crucifer products on fields.
3. The ground to be used for seedbeds should have had no crucifer production for 2 consecutive years.
4. Seedbeds and greenhouses should be kept free of crucifer seeds and should receive regularly scheduled pesticides to insure freedom from diseases and insect damage.
5. Equipment used in seedbeds or greenhouses should not be used on other crucifer crops or should be decontaminated before bringing it back into the seedbed area.
6. Transplants should not: be "topped" to fit into shipping crates or sprayed with or dipped in water prior to transplanting.
7. Only new crates or crates not previously used for crucifers should be used for shipping transplants.
8. The plants should be certified by local state agricultural inspectors at the time of pulling, prior to shipment.

For field grower:

1. Purchase your own seed from U. S. firms and verify that the seed has been hot-water treated, certified free of X. campestris, and identified with a specific seed lot production before sending it to a transplant grower.
2. Be sure that plants are certified by local state agricultural inspectors.
3. Grow plants in fields that had not been in crucifers for at least 2 consecutive years.
4. Keep crucifer weeds under control or they may serve as a source of disease.
5. Do not use the same equipment in both certified and noncertified fields unless it is decontaminated before entering certified fields.

LITERATURE

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